UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,107	02/27/2002	Kenji Kondo	5077-000087	6824

			EXAMINER
27572	7590	08/15/2005	AKHAVANNIK, HADI

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ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☐ Claim(s) _____ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-4 and 6-15* is/are rejected.
7) ☒ Claim(s) *5* is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>27 February 2005</u> is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☒ All   b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/18/2005</u>.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Drawings

The drawings are objected to because figures 11a, 11b, and 11c are from prior art Daugman (5291560). Please state that it is from prior art. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Object to drawings

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Frequency and resolution analyzed biometric authentication method and device.

Claim Objections

Claim 6 is objected to because of the following informalities: the claim does specify how the resolution of the iris image is determined from the information on the apparatus with which the iris image is taken. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1.   Claims 1, 2, 7, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Daugman (5291560).

Regarding claims 1 and 14, Daugman discloses a personal authentication method and device that uses biological information (column 2 lines 31-34 and figure 1 describe how to use an iris).

Biological information is frequency-analyzed using a plurality of frequencies to generate the feature at each frequency and register the feature (Column 18 lines 18-21 disclose that the Gabor coefficients that set the frequency range of the Gabor filter can be set to multiple scales of analysis. Column 11 lines 5-25 disclose the equations that make up the Gabor filter, which includes the Gabor coefficients. Figure 3 discloses that Gabor filters can have different ranges. Figure 1 items 20, 22, 24 and column 4 line 53 to column 5 line 11 disclose that a feature is generated and stored).

Selecting a frequency used for frequency analysis for authentication from a plurality of frequencies (See reasoning of Gabor filters frequency coefficients and frequency range above and Figure 3 Item 18, column 4 lines 55-59, column 8 lines 49-55, and column 9 line 53 to column 9 line 22 which discloses that an analysis band is chosen and it is analyzed using Gabor filters).

Performing frequency analysis of acquired biological information of a person to be authenticated using selected frequency to generate a feature for the frequency (See discussion of Gabor filters frequency coefficients and frequency range above and Figure 1 items 20, 22, 24, figure 2, and column 4 line 53 to column 5 line 11 disclose that a feature is generated by way of an identification code at each analysis band which is analogous to a frequency due to the way Gabor filters function).

Comparing generated feature with the feature generated for the same frequency during the registration to perform personal authentication (figure 1 item 24, 26, 28, 30 and column 4 lines 60-70 disclose that an iris code is registered an compared to make an identification).

Regarding claims 2 and 15, Daugman discloses that the biological information used is an iris of the eye (figure 1 item 12, 14, figure 2, and column 2 lines 50-70 disclose that the iris of the eye is used as biological information).

Regarding claim 7, Daugman discloses that the selection of the frequency during authentication is performed based on authentication precision for each combination of plurality of frequencies (see discussion of Gabor filter frequency above and column 10 line 60 to column 11 line 25 disclose that the iris code, which determines authentication, is determined by the response of the Gabor filter over the portion of the iris. The Gabor filter determines which frequency to select from a range of frequencies and what precision to look for based on the equation that makes up the Gabor fitler).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1, 7, 9, 11-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsumoto et al. (Publication number US 2002/0181749 A1, referred to as "Matsumoto" herein).

Regarding claims 1 and 14, Matsumoto discloses a personal authentication

method and device that uses biological information (figure 1 and paragraphs 46, 73-74

disclose a personal authentication system that uses fingerprint images for

authentication).

Biological information is frequency-analyzed using a plurality of frequencies to

generate the feature at each frequency and register the feature (paragraphs 105-114,

specifically paragraph 114 discloses frequency conversion at a plurality of frequencies

F(i). Figure 1 item 16 and paragraphs 26 and 30 discloses generating and looking for a

feature. Figure 1 item 18, figure 2 item s20 and s22, figure 3 item s46, and paragraph

162 disclose registering of features).

Selecting a frequency used for frequency analysis for authentication from a

plurality of frequencies (paragraph 36-40 discloses the ability to select a waveform, from

a certain frequency range for comparison).

Performing frequency analysis of acquired biological information of a person to

be authenticated using selected frequency to generate a feature for the frequency (see

discussion of frequency analysis authentication above and paragraph 40 specifically

discloses generating a characteristic such as average oscillation and average pitch).

Comparing generated feature with the feature generated for the same frequency

during the registration to perform personal authentication (paragraph 44 discloses a

means for comparing a certain density pattern. The density pattern is a generated

feature from a specific frequency range).

Regarding claim 7, Matsumoto discloses that the selection of the frequency during authentication is performed based on authentication precision for each combination of plurality of frequencies (figures 2-4 and paragraphs 153-163 describe how the frequency with the best image quality is selected for comparison. Specifically, paragraph 156 discloses how certain characteristic parameters are extracted from the image and figure 4 item s58 describe limited signal component. The limited signal component can be analyzed in the frequency domain with the frequency representing the highest authentication precision being selected).

Regarding claim 9, Matsumoto discloses that the authentication precision during the authentication is estimated from the selected frequency (paragraph 116 states that the equation calculating image quality is determined from the ration of low frequency and high frequency components).

Regarding claim 11 and 12, Matsumoto discloses that the decision of whether or not a person to be authenticated should be authenticated is judged based on the authentication precision (figure 5 and paragraphs 161-165 describe the process of whether or not a person is authenticated).

Regarding claim 13, Matsumoto discloses that the decision of whether or not re-authentication is performed is based on the authentication precision (paragraph 161 discloses that the authentication process can be repeated if necessary).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 2-4, 6, 8, 10 and 15 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Matsumoto in view of Daugman.

Matsumoto discloses all aspects of claim 2 and 15 except he does not disclose

the use of an image of an iris of an eye.

Daugman discloses the use of an image of an iris of an eye (figure 2 and column

2 lines 50-70 disclose the use of an image of the iris.

It would have been obvious at the time of the invention to one of ordinary skill in

the art to include in Matsumoto the ability to use an image of the iris of the eye as

biological information as taught by Daugman in order to create a more flexible and

dynamic system that gives another secure method of biometric identification. Further,

both references are from the same field of endeavor and same problem solving area of

biometric authentication.

Regarding claims 3, Matsumoto discloses that the selection of the frequency

during authentication is performed based on a resolution of the iris image (paragraph

117-119 describe that image quality is based on the number of dots in a predetermined

area. The number of dots represents the amount of ridgeline information that is present

in the image. The higher the resolution of the image can result in a greater amount of

ridgeline information. This leads to more dots per area and thus a greater resolution.

Paragraph 120-127 discloses that the frequency is selected based on the quality of the image, which based on the resolution as discussed above).

Regarding claim 4, Matsumoto discloses that the resolution of the iris image is based on the iris image itself (paragraph 117-119 describe that image quality is based on the number of dots in a predetermined area. The number of dots represents the amount of ridgeline information that is present in the image. The higher the resolution of the image can result in a greater amount of ridgeline information. This leads to more dots per area and thus a greater resolution).

Regarding claim 6, Matsumoto discloses that the resolution of the image is determined from information on an apparatus with which the iris image was taken (the apparatus that takes the image of the iris has a set resolution. So, resolution of the image is determined from the image that the apparatus produced. Paragraph 117-119 describe that image quality is based on the number of dots in a predetermined area. The number of dots represents the amount of ridgeline information that is present in the image. The higher the resolution of the image can result in a greater amount of ridgeline information. This leads to more dots per area and thus a greater resolution).

4.   Matsumoto discloses all aspects of claim 8 except he does not disclose that the authentication precision is calculated using a distribution of authentication scores between identical persons and different persons.

It is a common skill in the art to calculate authentication precision based on the quality of comparison between identical and different persons. For example, Daugman

discloses that the authentication precision is calculated using a distribution of authentication scores between identical and different persons (figure 2 discloses an iris code and column 13 lines 26-41 disclose how the iris code is used to determine the authentication precision. The iris code is used to judge the similarity between like/dislike persons based on the hamming distance between the iris codes. The closer the similarities are between two iris codes the less likely a false positive will occur and the greater the authentication precision. Further see columns 14-18 which describe the process in greater detail).

It would have been obvious at the time of the invention to one of ordinary skill in the art to include in Matsumoto the ability to calculate authentication precision based on the similarity between like/dislike persons as taught by Daugman in order to create a more flexible and reliable system that can calculate authentication precision based on similarities and differences between identical and different persons. Further, both references are from the same field of endeavor and same problem solving area of biometric authentication.

Regarding claim 10, the above rejection of claim 8 meets all limitations of claim 10. The authentication precision can be calculated and estimated in a similar manner.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
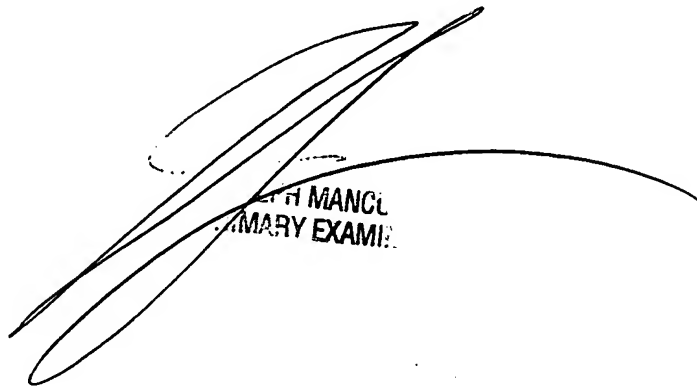
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ott (6872443 discloses frequency analyzing), Rowe et al. (6628809 B1 discloses spectrum analyzing), Wunderman et al. (6122042 discloses biometric frequency analyzing), Ginsburg (3993976 discloses frequency analyzing and resolution analyzing), "Two-Dimensional spectral analysis of cortical receptive field profiles" (written by John Daugman. Article written in Vision Research, vol. 20, pp. 847-856. Describes Gabor filters in more detail), "Uncertainty relation for resolution in space, spatial frequency, and orientation optimized by two-dimensional visual cortical filters (written by John Daugman Article written in Journal of the Optical Society of America, volume 2 (7), pp. 1160-1169. Discloses Gabor filters in more detal).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hadi Akhavannik whose telephone number is 571-272-8622. The examiner can normally be reached on 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

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MARY EXAMI